

REMARKS

Applicant sincerely thanks the Examiner for the courtesies extended in the telephone interview conducted between the Examiner and the undersigned on November 21, 2005.

The application has been reviewed in light of the Office Action dated August 24, 2005. Claims 1-23 were pending. The Office Action indicates that claims 1-8 have been allowed. By this Amendment, new dependent claims 24-27 have been added, and independent claims 9, 15 and 18-23 have been amended to place the claims in better form for reconsideration, without narrowing a scope of the claimed invention. Accordingly, claims 1-27 are now pending, with claims 1, 6-9, 15 and 18-23 being in independent form.

Claims 9, 10, 12, 14, 15 and 17-23 were rejected under 35 U.S.C. §102(b) as purportedly anticipated by Japanese Patent Application Publication No. JP 2002-67303A (Inoue). Claims 11 and 13 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Inoue in view of Japanese Patent Application Publication No. JP 2002-240282A (Yamanaka). Claim 16 was rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Inoue in view of Japanese Patent Application Publication No. JP 2000-299991A (Kitahara).

This application relates to improvements to an electrostatic actuator (which can be used in, for example, ink-jet recording), in order to maintain stable operational characteristics even when environmental conditions (such as temperature and pressure) change. The improved electrostatic actuator typically comprises a vibration chamber and an electrode provided opposite the diaphragm. At least one side of the vibration chamber is formed by a diaphragm deformable by an electrostatic force. In addition, the electrostatic actuator further includes a pressure correcting chamber communicating with the vibration chamber. At least one side of the pressure correcting chamber is formed by a deformable part that is displaceable in accordance with an external pressure. The combination of the pressure correcting chamber and the deformable part

absorbs a change in the relative pressure difference as between the vibration chamber and an environment external to the electrostatic actuator, such that the equilibrium position of the deformable part changes while the equilibrium position of the diaphragm remains substantially unchanged. In addition, the electrostatic actuator may include additional features such as the following: (i) a part that reduces an area of contact formed when the deformable part comes into contact with a second side of the pressure correcting chamber, the second side opposing the deformable part (independent claims 9, 18, 20 and 22); and (ii) a sticking preventing part formed on a second side of the pressure correcting chamber so as to prevent the deformable part from sticking to the second side when the deformable part comes into contact therewith, the second side opposing the deformable part (independent claims 15, 19, 21 and 23).

The cited art does not disclose or suggest the claimed invention.

Inoue, as understood by Applicant, is directed to an ink jet head equipped with vibrating plates which constitute one side of an ink liquid chamber, wherein vibrating plate substrates possess thin film moving electrodes on a surface of the vibrating plates outside of the ink liquid chamber and adjacent to a diaphragm, and electrode substrates possess thin film solid electrodes facing the thin film moving electrodes. In addition, minute projection stoppers are formed on the surface of the thin film movable electrode so as to prevent the thin film movable electrode from coming into contact and short-circuiting with the thin film fixed electrode, even when the diaphragm is greatly displaced.

As discussed in the telephone interview, Applicant does not find teaching or suggestion, however, in Inoue of an electrostatic actuator comprising a pressure correcting chamber communicating with the vibration chamber, wherein at least one side of the pressure correcting chamber is formed by a deformable part that is displaceable in accordance with an external pressure, as provided by independent claims 9, 15 and 18-23.

Yamanaka is directed to a liquid drop discharge head wherein diaphragms and electrodes are set in silicon substrates, and the substrates are joined via a silicon dioxide film. Yamanaka was cited in the Office Action as purportedly disclosing a projection formed of a material selected from a group consisting of silicon oxide and nitride oxide.

Kitahara, as understood by Applicant, is directed to an electrostatic actuator adapted to restrict occurrence of adhesion of counter electrodes and overlap of hydrophobic films formed on the surfaces of the electrodes. Kitahara was cited in the Office Action as purportedly disclosing use of a hydrophobic film as a sticking preventing part.

However, Yamanaka and Kitahara, like Inoue, do not teach or suggest an electrostatic actuator comprising a pressure correcting chamber communicating with the vibration chamber, wherein at least one side of the pressure correcting chamber is formed by a deformable part that is displaceable in accordance with an external pressure, as provided by independent claims 9, 15 and 18-23.

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claims 9, 15 and 18-23 and the claims depending therefrom are patentable over the cited art.

The Office Action indicates that claims 1-8 are allowed.

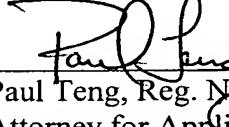
Applicant appreciates the Examiner's statement of reasons for allowance in the Office Action and submits that the allowed claims recite subject matter which further supports patentability for reasons in addition to those identified in the Examiner's statement of reasons for allowance in the Office Action.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Office is hereby authorized to charge any fees that may be required in connection with this response and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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